$V_{RM}$ = 200 V, $I_{F(AV)}$ = 20 A, $t_{rr}$ = 40 ns
Fast Recovery Diode

# FML-4202S

Data Sheet

## Description

The FML-4202S is a fast recovery diode of 200 V / 20 A. The maximum $t_{rr}$ of 40 ns is realized by optimizing a life-time control.

## Features

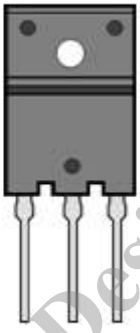
- $V_{RM}$ ---------- 200 V
- $I_{F(AV)}$ ---------- 20 A
- $V_F$ ---------- 0.98 V
- $t_{rr1}$ ---------- 40 ns
- Bare lead frame: Pb-free (RoHS compliant)
- Flammability: Equivalent to UL94V-0

## Applications

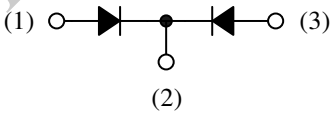
- Secondary-side Rectifier Diode
  (Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
  (Offline Buck Converter, Offline Buck-boost Converter, etc.)

## Package

TO3PF-3L




Not to scale




(1) Anode
(2) Cathode
(3) Anode

## Absolute Maximum Ratings

Unless otherwise specified, $T_A$ = 25 °C.

| Parameter | Symbol | Conditions | Rating | Unit |
|---|---|---|---|---|
| Nonrepetitive Peak Reverse Voltage(1) | $V_{RSM}$ | | 200 | V |
| Repetitive Peak Reverse Voltage(1) | $V_{RM}$ | | 200 | V |
| Average Forward Current | $I_{F(AV)}$ | See Figure 1 and Figure 2 | 20 | A |
| Surge Forward Current(1) | $I_{FSM}$ | Half cycle sine wave, positive side, 10 ms, 1 shot | 150 | A |
| $I^2t$ Limiting Value(1) | $I^2t$ | 1 ms ≤ t ≤ 10 ms | 112.5 | $A^2s$ |
| Junction Temperature | $T_J$ | | −40 to 150 | °C |
| Storage Temperature | $T_{STG}$ | | −40 to 150 | °C |

## Electrical Characteristics

Unless otherwise specified, $T_A$ = 25 °C.

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage Drop(1) | $V_F$ | $T_J$ = 25 °C, $I_F$ = 10 A | — | — | 0.98 | V |
| | | $T_J$ = 100 °C, $I_F$ = 10 A | — | 0.80 | — | V |
| Reverse Leakage Current(1) | $I_R$ | $V_R = V_{RM}$ | — | — | 10 | μA |
| Reverse Leakage Current under High Temperature(1) | $H \cdot I_R$ | $V_R = V_{RM}$, $T_J$ = 150 °C | — | — | 400 | μA |
| Reverse Recovery Time(1) | $t_{rr1}$ | $I_F = I_{RP}$ = 500 mA, 90% recovery point, $T_J$ = 25 °C | — | — | 40 | ns |
| | $t_{rr2}$ | $I_F$ = 500 mA, $I_{RP}$ = 1 A, 75% recovery point, $T_J$ = 25 °C | — | — | 30 | ns |
| Thermal Resistance(2) | $R_{th(J-C)}$ | | — | — | 2.0 | °C/W |

## Mechanical Characteristics

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Heatsink Mounting Screw Torque | | 0.686 | — | 0.882 | N·m |



(1) Specifies a value per chip; the FML-4202S consists of two chips.
(2) $R_{th\ (J-C)}$ is thermal resistance between junction and the case. The case temperature is measured at the back side near the screw hole.

## Rating and Characteristic Curves

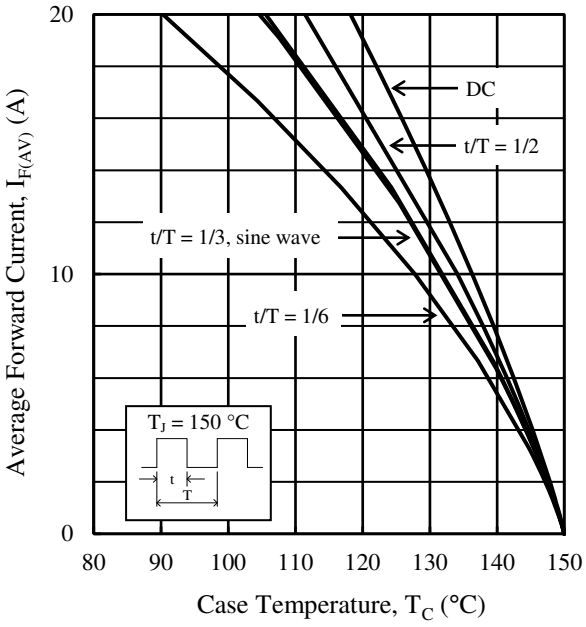



Figure 1. Typical Characteristics: $I_{F(AV)}$ vs. $T_C$ ($V_R$ = 0 V)

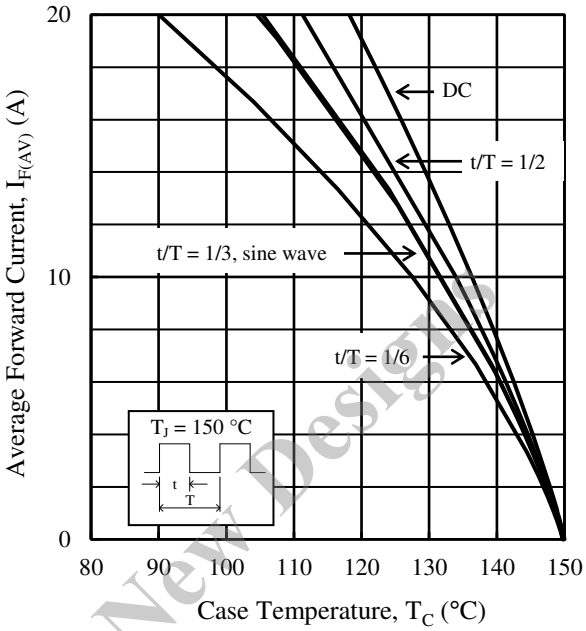



Figure 2. Typical Characteristics: $I_{F(AV)}$ vs. $T_C$ ($V_R$ = 200 V)

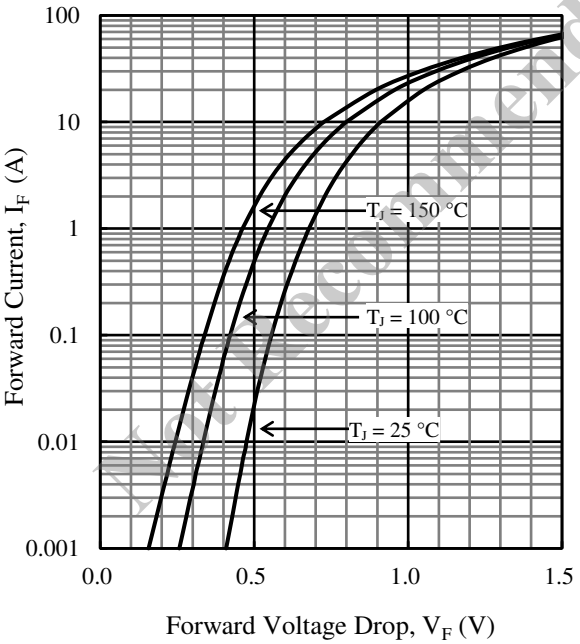



Figure 3. Typical Characteristics: $I_F$ vs. $V_F$

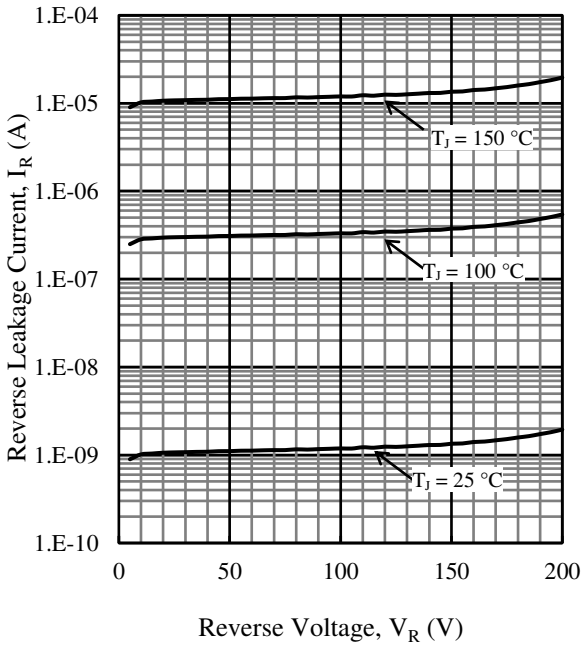
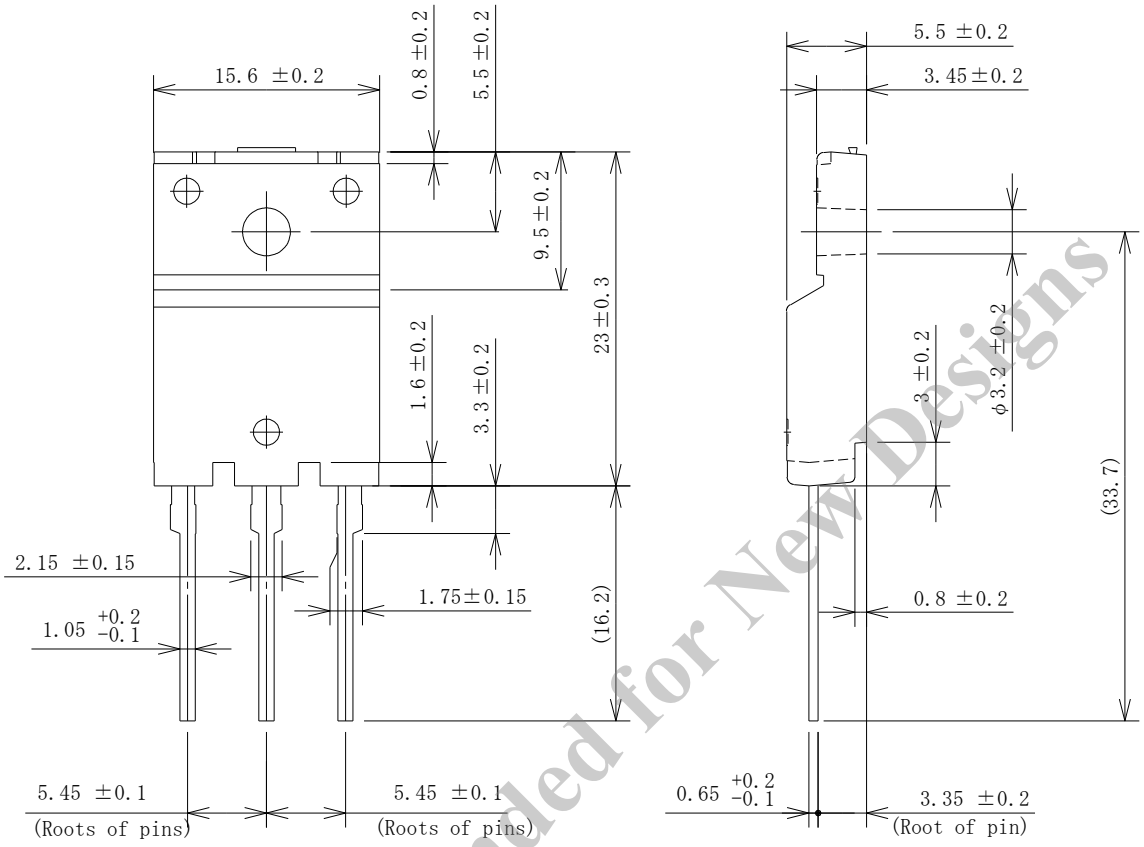
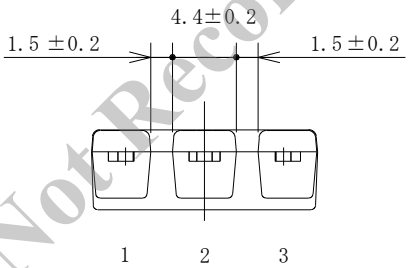


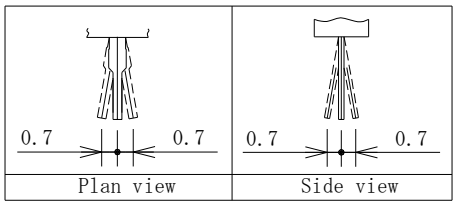

Figure 4. Typical Characteristics: $I_R$ vs. $V_R$

## Physical Dimensions

● **TO3PF-3L**



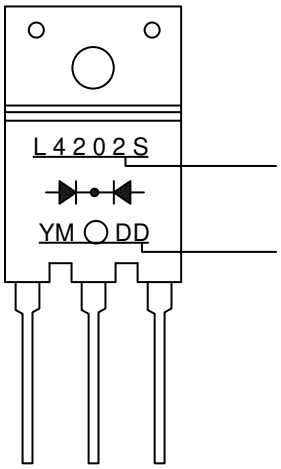






**NOTES:**

- Dimensions in millimeters.
- Maximum gate burr height is 0.3 mm.
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, it is required to minimize the working time within the following limits:
  Flow: 260 ± 5 °C / 10 ± 1 s, 2 times
  Soldering Iron: 380 ± 10 °C / 3.5 ± 0.5 s, 1 time
  Soldering should be at a distance of at least 1.5 mm from the body of the product.

## Marking Diagram




Specific Device Code (See Table 1)

Lot Number:
Y is the last digit of the year of manufacture (0 to 9)
M is the month of the year (1 to 9, O, N, or D)
DD is the day of the month (01 to 31)

Table 1. Specific Device Code

| Specific Device Code | Part Number |
|---|---|
| L4202S | FML-4202S |

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